Paper No. 17

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte GERAILD J. JULIEN

Appeal No. 2002-0018
Application No. 09/231,897

ON BRIEF

Before FRANKFORT, STAAB, and BAHR, Administrative Patent Judges.

STAAB, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final rejection of claims 1-4, 16-19 and 24-36, all the claims currently pending in the application. Upon further review, the examiner now considers (see Paper No. 14) that dependent claim 4 would be allowable if rewritten in independent form to include all the limitations of base claim 1 from which it depends. Consequently, only the rejections of claims 1-3, 16-19 and 24-36 remain before us for review.

Appellant's invention pertains to a high pressure erosion resistant nozzle for cutting and cleaning, and more particularly to an improved liquid jet nozzle made of Nitinol. Claim 1, a copy of which appears in the Appendix to appellant's corrected main brief, is exemplary of the subject matter at issue.

The references of record relied upon by the examiner as evidence of obviousness are:

Buehler et al. (Buehler)	3,174,851	Mar. 23, 1965
Munoz	5,033,681	Jul. 23, 1991
Matsui et al. (Matsui)	5,434,112	Jul. 18, 1995

Claims 1, 2, 16, 19, 24, 28-30, 32, 33 and 36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsui in view of Buehler.

Claims 3, 17, 18, 25-27, 31, 34 and 35 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsui in view of Buehler and further in view of Munoz.

Reference is made to appellant's corrected main brief and reply brief (Paper Nos. 11 and 13) and to the examiner's answer (Paper No. 12) for the respective positions of appellant and the examiner regarding the merits of these rejections.

Discussion

Having carefully considered the examiner's position in light of the combined teachings of Matsui, Buehler and Munoz we find ourselves in agreement with appellant that the standing rejections cannot be sustained. Our reasons follow.

Independent claim 1 calls for a liquid jet nozzle for forming a high velocity liquid jet from pressurized liquid comprising a nozzle body made of monolithic Nitinol. Claims 16, 24, 28 and 32, the other independent claims on appeal, contain similar language.

In rejecting these claims, the examiner considers that Matsui discloses a high pressure injection nozzle formed from a super hard alloy. The examiner concedes that the nozzle body of Matsui is not made of Nitinol. The examiner takes the position, however, that it would have been obvious to one of ordinary skill in the art to make Matsui's nozzle body of a nickel based alloy such as Nitinol in view of Buehler. More particularly, the examiner asserts (answer, pages 3-4):

> Buehler et al teaches that Nickel-Based Alloys, such as Nitinol containing 56-64% weight nickel, are capable of achieving high hardness and corrosion resistance (column 1, line 35; and column 8, lines 36-37).
>
> It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have replaced the metal alloy used in Matsui et al's invention with Monolithic Nitinol (or Nitinol 60), since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshing [sic, Leshin], 125 USPQ 416.

The examiner's position is further explained on page 5 of the answer as follows:

> . . . Matsui et al as well as applicant are interested in using materials to make nozzles that are abrasive resistant (column 1, lines 12-16). It is the position of the examiner that one having ordinary skill in the art would consider all materials that exhibit abrasive resistant properties as candidates for a liquid jet nozzle that requires high abrasion resistance. . . .
>
> . . . Buehler discloses that Nitinol has abrasive resistant properties (column 1, line 35; and column 8, lines 36-37). Therefore, while considering metals for candidacy as a material for liquid jet nozzles, Nitinol would make a good candidate.

As correctly pointed out by appellant in both the corrected main brief and reply brief, the thrust of Matsui is the provision of a high pressure injection nozzle member formed of a super hard alloy or a hard sintered material having a hardness of more that about 94 HRA (Rockwell A) (column 3, lines 55-56; column 3, lines 64-67; column 4, lines 7-10). This is a result of Matsui's finding that hardness is of paramount importance in designing a high pressure injection nozzle, to the point of accepting lower than previously thought to be acceptable tenacity in order to obtain the desired high degree of hardness (column 9, lines 41-45; column 10, lines 47-56; column 13, lines 20-23). The range of acceptable hardness for Matsui's purposes is further exemplified upon review of the graphs of Figures 2, 12 and 14, where the black circles (●) represent Matsui's invention and the white circles (○) represent what Matsui calls "conventional" technology. As can be clearly discerned from the graphs of Figures 2, 12 and 14, the alloys of Matsui's invention all have hardnesses of about 94 HRA (Rockwell A) or higher, whereas the alloys of the "conventional" technology having hardnesses as high as 88 to 93 HRA (Rockwell A) are not acceptable in accordance with Matsui's teachings.

Turning to Buehler, this reference teaches, among other things, that the titanium-nickel alloy disclosed therein is "capable of heat treatment to any required hardness value from approximately about 65 R_b to approximately about 62 R_c" (column 1, lines 50-52)[1]. Thus, the "high hardness" referred to, for example, in column 3, line 12, of Buehler must be read in the context of the overall disclosure of that reference to refer to hardness in the range of about 65 R_b (65 Rockwell B) to about 62 R_c (62 Rockwell C), which converts to a hardness of about 42 Rockwell A to about 83 Rockwell A[2].

Matsui teaches that the material used to make the nozzle thereof should have a hardness of about 94 Rockwell A or higher. Moreover, Matsui rejects as unacceptable nozzles made of materials in accordance with "conventional" technology that have hardnesses as high as 88 to 93 Rockwell A. Given these facts, the examiner has not adequately explained, and it is not apparent to us, why one of ordinary skill in the art would consider the titanium-nickel alloy disclosed in Buehler, which is disclosed as having a hardness in the range of about 65 R_b (42 Rockwell A) to about 62 R_c (83 Rockwell A), to be a good candidate for use in Matsui. From our perspective, one of ordinary skill in the art would not consider the alloys disclosed in Buehler to be good candidate materials for use in Matsui because Buehler's alloys are even softer than the materials of the

[1]In considering the teachings of Buehler, we consider R_b to denote Rockwell B hardness and R_c to denote Rockwell C hardness.

[2]Our conversion of the Rockwell B and Rockwell C hardnesses set forth in Buehler is derived from the attached "Equivalent Hardness Conversion Table," found at: http://www.gordonengland.co.uk/hardness/hardness_conversion_1m.htm.

"conventional" technology that Matsui rejects as being too soft. As cogently argued by appellant on page 4 of the reply brief, the examiner's approach would have the person of ordinary skill behave contrary to logic, by selecting a material on the basis of a single vague and general statement about abrasion resistance in the face of a detailed explanation in Matsui, the primary reference, about the benefits of choosing much harder materials than disclosed in Buehler.

In light of the forgoing, the standing rejection of claims 1, 2, 16, 19, 24, 28-30, 32, 33 and 36 as being unpatentable over Matsui in view of Buehler cannot be sustained.

As for the standing rejection of claims 3, 17, 18, 25-27, 31, 34 and 35 as being unpatentable further in view of Munoz, we have carefully considering the teachings of this additional reference but find nothing therein that makes up for the deficiencies of Matsui and Buehler discussed above. Accordingly the rejection of claims 3, 17, 18, 25-27, 31, 34 and 35 also cannot be sustained.

The decision of the examiner is reversed.

REVERSED

CHARLES E. FRANKFORT Administrative Patent Judge	)))))) BOARD OF PATENT
LAWRENCE J. STAAB Administrative Patent Judge	) APPEALS) AND) INTERFERENCES
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LJS/lp

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